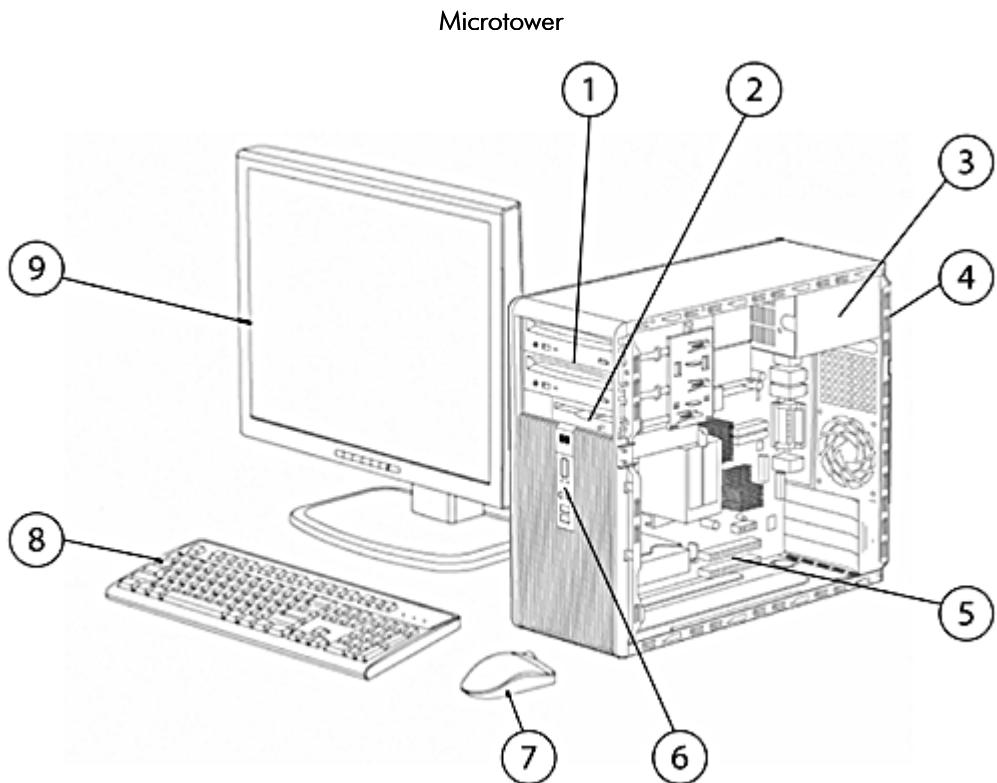


Overview

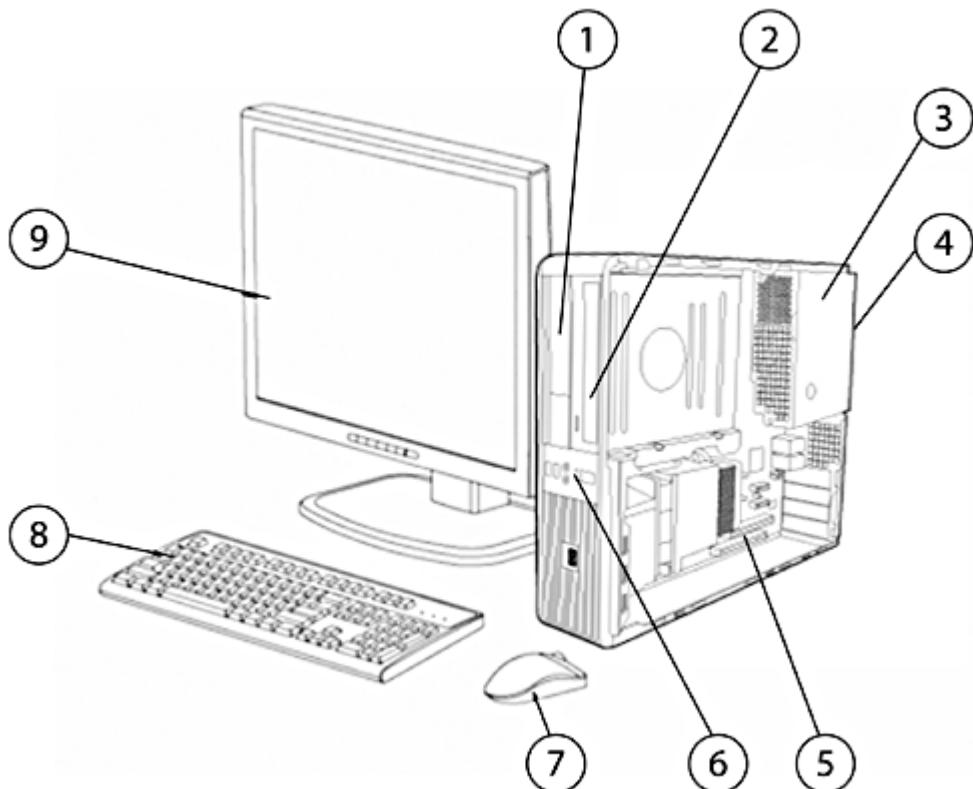
HP recommends
Windows Vista® Business



1. (2) 5.25" external bays and (2) 3.5" internal bays
2. (1) 3.5" external bay for optional HP 16-in-1 Media Card Reader, diskette drive, or other 3.5" device
3. 300-watt power supply
Optional: 85% efficient energy saving power supply
4. Rear I/O: (6) USB 2.0, (1) standard serial port, (1) optional serial port, (1) optional parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) DVI-D, (1) audio in, (1) audio out
5. (1) full-height PCI slot, (2) full-height PCIe x1 slots, (1) full-height PCIe x16 slot
6. Front I/O: (2) USB 2.0, headphone and microphone, Dual Color Diagnostic LEDs
7. 2-Button Scroll Mouse (PS/2), Optical Scroll Mouse (PS/2 or USB), or USB Laser Mouse
8. HP Standard Keyboard (PS/2 or USB) or HP USB Smartcard Keyboard
9. Monitor (sold separately)

Overview

Small Form Factor



1. (1) 3.5" external bay for optional HP 16-in-1 Media Card Reader, diskette drive, or other 3.5" device;
(1) 3.5" internal bay
2. (1) 5.25" external bay for optional optical drive, or other 5.25" device (bay tilts up for device removal and insertion)
3. 240-watt power supply
Optional: 85% efficient energy saving power supply
4. Rear I/O: (6) USB 2.0, (1) standard serial port, (1) optional serial port, (1) optional parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) DVI-D, (1) audio in, (1) audio out
5. (1) low profile PCI slot, (2) low profile PCIe x1 slots,
(1) low profile PCIe x16 slot
6. Front I/O: (2) USB 2.0, headphone and microphone, Dual Color Diagnostic LEDs
7. 2-Button Scroll Mouse (PS/2), Optical Scroll Mouse (PS/2 or USB), or USB Laser Mouse
8. HP Standard Keyboard (PS/2 or USB) or HP USB Smartcard Keyboard
9. Monitor (sold separately)

Overview

At A Glance

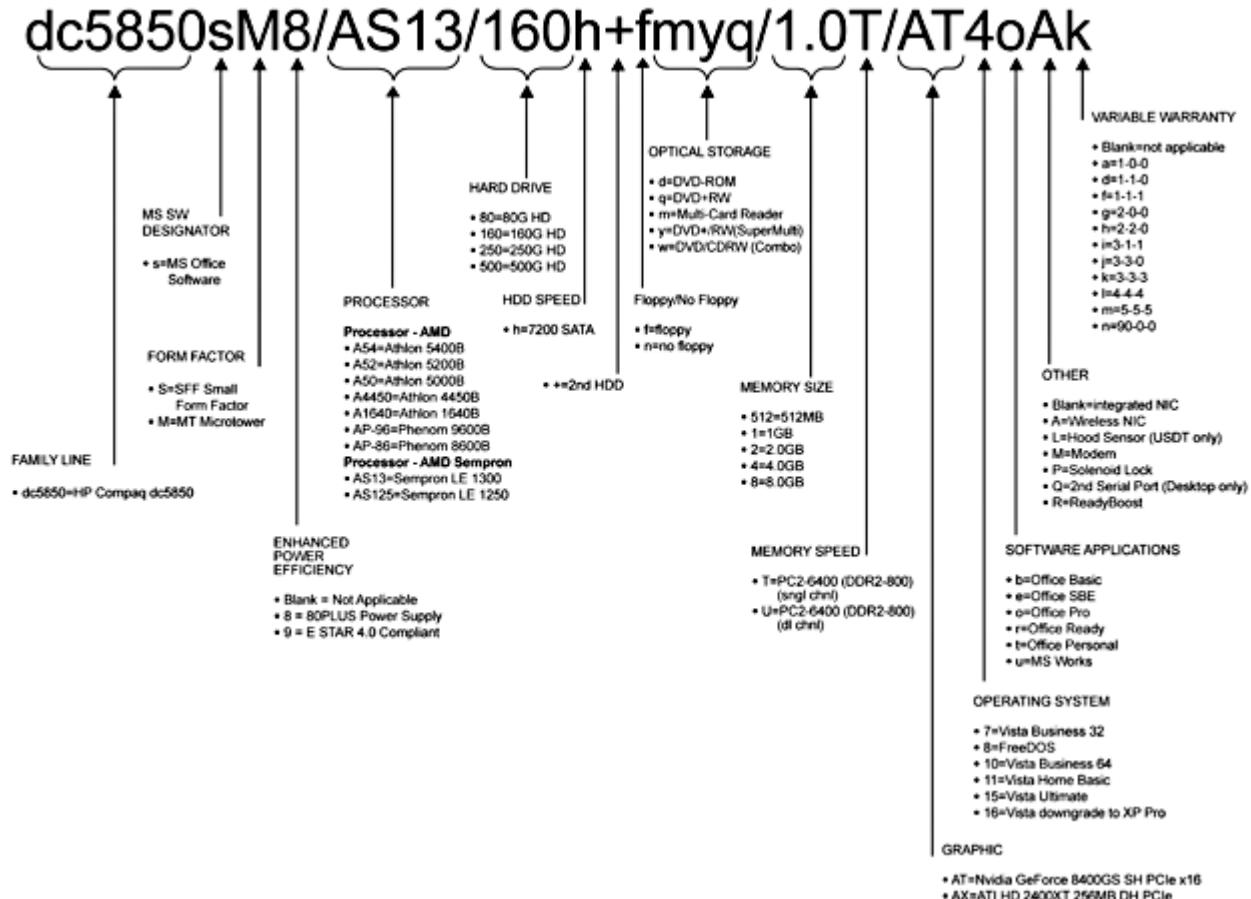
- The HP Compaq dc5850 offers a stable solution with mainstream features and flexibility that exceed basic business requirements
- AMD 780V chipset with integrated ATI Radeon 3100 graphics
- AMD Phenom™ Quad and Triple Core processors, AMD Athlon™ 64 X2 Dual Core processors, AMD Athlon 64 processors, and AMD Sempron™ processors
- Embedded TPM1.2 compliant security module* (Vista Bit-Locker ready)
- Support for up to 500-GB SATA 3.0Gb/s Smart IV hard drives
- RAID 0/1 support
- Value-added software on select models
 - HP Total Care Advisor
 - HP Backup and Recovery Manager
 - HP Software Agent
 - Altiris Deployment Solution Agent
 - HP Insight Diagnostics software
 - Microsoft Office 2007
 - Verdiem Surveyor remote power management agent
 - Computrace for Desktops (select countries)
 - HP Power Manager
- Value-added software available for free download from the Web (<http://www.hp.com/go/easydeploy>)
- HP Client Automation – Starter Edition
- HP Client Manager for Altiris
- Altiris Out-of-Band Management Solution
- HP SoftPaq Download Manager
- HP System Software Manager
- HP Client Catalog for Microsoft SMS
- Verdiem Surveyor remote power management agent
- Fully compatible software OS image across all models (Microtower, Small Form Factor)
- HP BIOS for security, manageability and software image stability
- Standard 3-years parts, 3-years labor, and 3-years on-site warranty services
(terms and conditions vary by country; certain restrictions and exclusions apply)
- HP Insight Diagnostics software
- Selected configurations with global availability easily set up and ordered through HP.com Business to Business portals (<http://h10019.www1.hp.com/business-site/index.html>)
- Tailored HP Factory Express deployment and lifecycle services available
(<http://h71028.www7.hp.com/enterprise/cache/97688-0-0-225-121.aspx>)

*TPM module disabled where use is restricted by law; for example, Russia.

Configurable Components - Select Models (localized by Regions)

Model Key and Example

NOTE: This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.



Standard Features and Configurable Components

Operating System – One of the following	Preinstalled	Genuine Windows Vista Business 32*
		Genuine Windows Vista Business 64*
		Genuine Windows Vista Home Basic 32*
		Genuine Windows Vista Ultimate 32*
		Genuine Windows Vista Business 32 downgrade to Genuine Windows XP Professional 32
	Certified	FreeDOS
		Red Hat Enterprise Linux
		SUSE Linux Enterprise Desktop 10

* Certain Windows Vista product features require advanced or additional hardware. See:
<http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx> and
<http://www.microsoft.com/windowsvista/getready/capable.mspx> for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: <http://www.windowsvista.com/upgradeadvisor>.

Value-added Software (on Altiris Deployment Solution Agent select models; not included with FreeDOS)	HP Software Agent	HP Total Care Advisor
	Altiris Out-of-Band Management Solution	Microsoft Office 2007 Basic
	HP Insight Diagnostics (available via HP Backup and Recovery Manager)	Microsoft Office 2007 Personal
	Computer Setup Utility	Microsoft Office 2007 Professional
	HP Backup and Recovery Manager	Microsoft Office 2007 Small Business
	HP Power Manager	Microsoft Works 8.5
	Sonic/Roxio DigitalMedia Plus 7.2 (select models) or Easy Media Creator 9 (select models)	Microsoft Internet Explorer with AOL Toolbar Comptrace for Desktops (select countries) Verdiem Surveyor agent InterVideo WinDVD 5.0 (select models) Firefox-HP Virtual Browser

Value-added Software (available for free download from the Web http://www.hp.com/go/easydeploy)	HP Client Automation – Starter Edition	HP Client Catalog for Microsoft SMS
	HP Client Manager for Altiris	HP Systems Software Manager
	HP SoftPaq Download Manager	Verdiem Surveyor agent

Value-added Services and Features	HP Stable Platform Program	Factory Express Deployment and Lifecycle Services
	Business-to-Business Portals	TPM 1.2 Security chip*
	HP Global Series Services	
* TPM module disabled where use is restricted by law; for example, Russia.		

Standard Features and Configurable Components

Service and Support

On-site Warranty and Service **Note 1**: This three-year (3-3-3), limited warranty and service offering delivers three years of parts, labor and on-site repair. Response time is next business-day **Note 2** and includes free telephone support **Note 3** 24 x 7. Global coverage **Note 2** ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labor. For HP Care Pack services see <http://www.hp.com/go/lookuptool>.

NOTE 1: Terms and conditions may vary by country. Certain restrictions and exclusions apply.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

NOTE 3: Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

	Microtower	Small Form Factor
Chassis Dimensions (H x W x D)	14.85 x 6.95 x 16.85 in (37.72 x 17.65 x 42.80 cm)	3.95 x 13.3 x 14.9 in (10.03 x 33.78 x 37.85 cm)
Optional Tower Stand Dimensions (H x W x D)	N/A	1.05 x 6.95 x 7.83 in (26.75 x 176.46 x 198.87 mm)
System weight*	20.42 lb (9.28 kg)	16.76 lb (7.62 kg)
System volume	1739 cu in	782.77 cu in
Shipping weight*	29.44 lb (13.38 kg)	25.08 lb (11.40 kg)
Maximum supported weight (desktop orientation)	77.1 lb (35 kg)	77.1 lb (35 kg)
Shipping box dimensions (H x W x D)	12.0 x 19.76 x 23.62 in	9.72 x 19.68 x 22.67 in
* Configured with 1 hard drive, 1 optical drive, no diskette drive, and no PCI card.		
Power Supply	300W power supply – passive PFC	240W power supply - active PFC
Energy Efficient Power Supply	300W 85% efficient power supply – active PFC	240W 85% efficient power supply – active PFC
Ports		
USB 2.0	8 (2 front, 6 rear)	
Serial	1 standard with 2nd optional	
Parallel	1 optional	
PS/2	1 keyboard, 1 mouse	
Video	VGA and DVID for integrated graphics	
Support for Multi-Monitor	standard	
Audio	Integrated High Definition audio with internal speaker Front – mic and headphone Rear – input (supports microphone or line input), line out	
NIC (RJ-45)	Integrated Broadcom Gigabit Ethernet	

Standard Features and Configurable Components

		MT	SFF
Chipset	AMD 780V chipset	X	X
Processor	AMD Sempron Processors with HyperTransport™ Technology:		
One of the following	AMD Sempron LE-1300 Processor (2.3-GHz, 512K L2 cache, HT bus 1.0)	X	X
	AMD Sempron LE-1250 Processor (2.2-GHz, 512K L2 cache, HT bus 1.0)	X	X
	AMD Athlon Single-Core Processors with HyperTransport Technology:		
	AMD Athlon LE-1640B Processor (2.7-GHz, 512K L2 cache, HT bus 2.0)	X	X
	AMD Athlon Dual-Core Processors with HyperTransport Technology:		
	AMD Athlon X2 7750 Processor (2.7-GHz)	X	X
	AMD Athlon X2 6000+ Processor (3.1-GHz, 1MB L2 cache, HT bus 3.0)	X	X
	AMD Athlon X2 5800+ Processor (3.0-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 5600B Processor (2.9-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 5400B Processor (2.8-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 5200B Processor (2.7-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 5000B Processor (2.6-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 4850B Processor (2.5-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Athlon X2 4450B Processor (2.3-GHz, 1MB L2 cache, HT bus 2.0)	X	X
	AMD Phenom Dual-Core Processors with HyperTransport Technology:		
	AMD Phenom II X2 550 Processor (3.1 GHz, 1 MB Dedicated L2 cache, 6 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom Triple-Core Processors with HyperTransport Technology:		
	AMD Phenom II X3 710 Processor, (2.6-GHz, 1.5 MB Dedicated L2 cache, 6 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom X3 8600B Processor (2.3-GHz, 1.5 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom X3 8850B Processor (2.5-GHz, 1.5 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom Quad-Core Processors with HyperTransport Technology:		
	AMD Phenom II X4 805 Processor, (2.5-GHz, 2 MB Dedicated L2 cache, 4 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom II X4 810 Processor (2.6 GHz, 2 MB Dedicated L2 cache, 4 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom X4 9600B Processor (2.3-GHz, 2 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X
	AMD Phenom X4 9850B processor (2.5 GHz, 2 MB Dedicated L2 cache, 2 MB Shared L3 cache, HT bus 3.0)	X	X

Standard Features and Configurable Components

Memory

DDR2 SYNCH DRAM NON-ECC MEMORY

Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The AMD 780V chipset supports non-ECC DDR2 PC2-6400 (800-MHz) memory.

CAUTION: You must shut down the computer and disconnect the power cord before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

HP recommends dual-channel symmetric configurations for maximum performance.

For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM.

Microtower and Small Form Factor

Maximum Memory

Supports up to 16-GB of DDR2 SYNCH DRAM. Slot 4 is black and must always be populated. Next populate slots 3, 2, and 1 in that order. Not all memory configurations possible are represented below.

NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements. Addressing memory above 4 GB requires a 64-bit operating system.

DIMM Size	Slot			
	Channel A		Channel B	
	4 (black)	2 (white)	3 (black)	1 (white)
512-MB	512-MB			
1-GB	1-GB			
1-GB (dual-channel symmetric)	512-MB		512-MB	
2-GB (dual-channel symmetric)	1-GB		1-GB	
2-GB (dual-channel symmetric)	512-MB	512-MB	512-MB	512-MB
3-GB (dual-channel symmetric)	1-GB	512-MB	1-GB	512-MB
4-GB maximum (dual-channel symmetric)	1-GB	1-GB	1-GB	1-GB
8-GB maximum (dual-channel symmetric)	2-GB	2-GB	2-GB	2-GB
16-GB maximum (dual-channel symmetric)	4-GB	4-GB	4-GB	4-GB

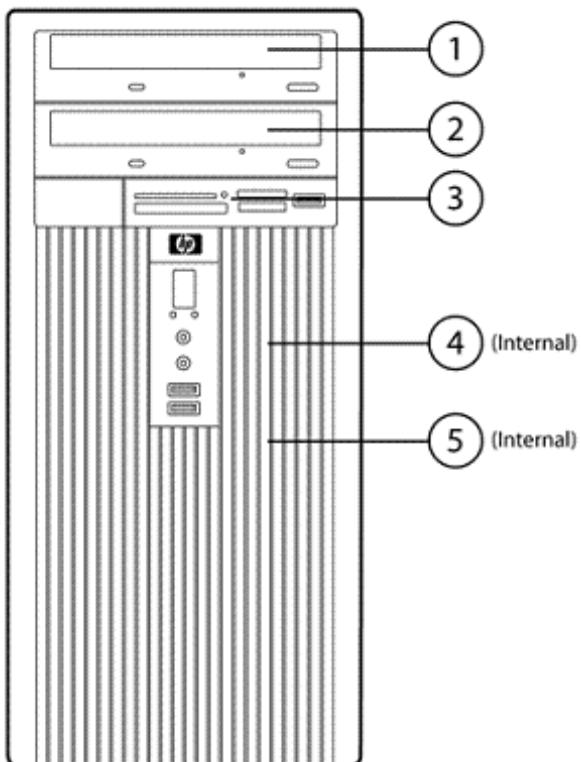
Standard Features and Configurable Components

		MT	SFF
Memory Configurations	512-MB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 512)	X	X
One of the following	1-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 1GB)	X	X
	1-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 512)	X	X
	2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 2GB)	X	X
	2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 1GB)	X	X
	2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 512)	X	X
	3-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (3 x 1GB)	X	X
	4-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 1GB)	X	X
	4-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 2GB)	X	X
	8-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 2GB)	X	X
	16-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 4GB)	X	X

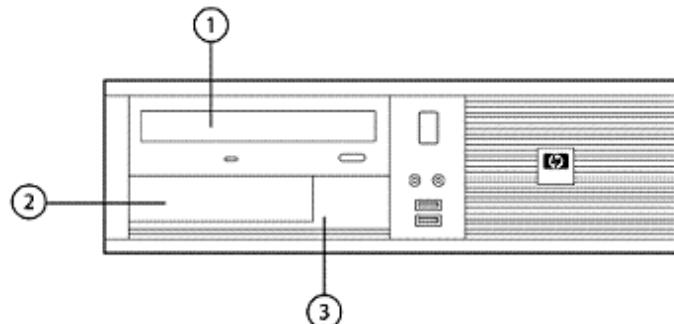
	Microtower	Small Form Factor
PCI slots	1 full-height	1 low-profile
Max power per slot	35W	35W
PCIe x1 slot	2	2
Max power per slot	10W	10W
PCIe x16 slot	1 full-height	1 low-profile
Max power per slot	60W	25W
External Bays		
3.5"	1	1
5.25"	2	1
IDE		
Internal 3.5" HDD Bays	2	1
Hard Drive Controller (SATA) Supported	SATA	SATA
Hard Drive Interfaces Supported	SATA 3.0Gb/s	SATA 3.0Gb/s

Standard Features and Configurable Components

Microtower



Small Form Factor



Storage – Drive Support

	Microtower			Small Form Factor		
	Media Card Reader or Diskette Drive (optional)	5.25" Serial ATA Devices	3.5" Serial ATA Devices	Media Card Reader or Diskette Drive (optional)	5.25" Serial ATA Devices	3.5" Serial ATA Devices
Quantity Supported	1	2	2	1	1	2
Position Supported	③	①, ②	③, ④, ⑤	②	①	②, ③
Controller	USB/Diskette	SATA	SATA	USB/Diskette	SATA	SATA

Standard Features and Configurable Components

		MT	SFF
Hard Drive	80-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
One or two of the following	160-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	250-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	500-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	80-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 10,000 RPM, NCQ, Smart III)	X	X
	160-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 10,000 RPM, NCQ, Smart III)	X	X
	320-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	3.5" Removable 80-GB SATA 3.0 Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	3.5" Removable 160-GB SATA 3.0 Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	3.5" Removable 250-GB SATA 3.0 Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	RAID 80-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X
	RAID 160-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X
	RAID 250-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)	X	X
	2 nd hard drive, 80-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2 nd hard drive, 160-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2 nd hard drive, 250-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2 nd hard drive, 320-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2 nd hard drive, 500-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 7200 RPM, NCQ, Smart IV)	X	X
	2 nd hard drive, 80-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 10,000 RPM, NCQ, Smart III)	X	X
	2 nd hard drive, 160-GB SATA 3.0-Gb/s Hard Drive (16MB Cache, 10,000 RPM, NCQ, Smart III)	X	X

NOTE: NCQ functionality requires a user set-up BIOS setting.

Standard Features and Configurable Components

Removable Storage – One or more of the following depending on form factor (see Storage Drive Support section above)	Diskette Drives 1.44-MB Diskette Drive	X	X
	Media Reader HP 16-in-1 Media Reader (USB connection on the system board)	X	X
	Optical Drives SATA DVD-ROM Drive ¹	X	X
	SATA CD-RW/DVD-ROM Combo Drive ^{1,2}	X	X
	SATA SuperMulti LightScribe DVD Writer Drive ^{1,2,3}	X	X
	HP SATA Blu-ray Writer	X	X
	NOTES:		
	¹ For playing DVDs, InterVideo WinDVD 5		
	² For writing CDs, choice of Sonic/Roxio DigitalMedia Plus 7.2 (Windows XP only) or Easy Media Creator 9		
	³ For writing CDs and DVDs, video editing and authoring DVDs, choice of Sonic/Roxio DigitalMedia Plus 7.2 (Windows XP only) or Easy Media Creator 9		
Media Card Reader – One of the following	HP 16-in-1 3.5" Media Card Reader	X	X
	HP 22-in-1 3.5" Media Card Reader	X	X
	HP 22-in-1 3.5" Media Card Reader with 1394	X	X
Security	Integrated 1.2 TPM Embedded Security Chip*	X	X
	HP Desktop Security lock kit (lock and cable)	X	X
	Security cable with Kensington lock	X	X
	Optional HP ProtectTools security software suite	X	X
	Optional USB Port Disable at factory (user configurable via BIOS)	X	X
	* TPM module disabled where use is restricted by law; for example, Russia.		
NIC	Integrated Broadcom Gigabit Ethernet (integrated on system board)	X	X
	Broadcom NetXtreme Gigabit Ethernet PCIe NIC Card	X	X
	Broadcom NetXtreme Plus Gigabit Ethernet PCIe NIC Card	X	X
Wireless	Wireless A+G PCI Card (full height bracket)	X	
	Wireless A+G PCI Card (low profile bracket)		X
	HP 802.11 b/g/n Wireless PCIe x1 card (full height bracket)	X	
	HP 802.11 b/g/n Wireless PCIe x1 card (low profile bracket)		X
Modem	2006 Agere PCI 56K International SoftModem (full height)	X	
	2006 Agere PCI 56K International SoftModem (low profile)		X
	LSI PCIe x1 Hi-Speed 56K International SoftModem	X	X

Standard Features and Configurable Components

Graphics	Integrated ATI Radeon 3100 Graphics (with DirectX 10 technology)	X	X
	NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Graphics Card	X	X
	ATI Radeon HD 2400 XT 256MB DH PCIe x16 Graphics Card	X	X
	ATI Radeon HD 3470 256 SH PCIe x16 Graphics Card	X	X
	ATI Radeon HD 3650 (512MB DH) PCIe x16 Graphics Card	X	
	ATI Radeon HD 4550 Dual Head PCIe x16 Graphics Card	X	X
	HP DisplayPort to VGA Adapter	X	X
Audio	Integrated High Definition audio with ADI1884 codec (all ports are stereo)	X	X
	Microphone and Headphone front ports	X	X
	Line-out and Line-In rear ports*	X	X
	Multistreaming capable*	X	X
	Internal Speaker	X	X
* Rear audio input port is re-taskable as Line-in or Microphone-in. External speakers must be powered externally. Multistreaming can be enabled in the ADI control panel to allow independent audio streams to be sent to/from the front and rear jacks. This allows for different audio applications to use separate audio ports on the system. For example, the front jacks could be used with a headset for a communications application while the rear jacks are being used with external speakers and a multimedia application.			
Input Devices	Keyboard – One of the following		
	HP PS/2 Standard Keyboard	X	X
	HP USB Standard Keyboard	X	X
	Mouse – One of the following		
	USB 2-Button Laser Mouse	X	X
	PS/2 2-Button Optical Scroll Mouse	X	X
	USB 2-Button Optical Scroll Mouse	X	X
Miscellaneous	HP FireWire / IEEE 1394 PCI Card (full height)	X	
	HP FireWire / IEEE 1394 PCI Card (low profile)		X
	2nd serial port adapter	X	
	2nd serial port adapter (low profile)		X
	Tower stand		X
	1-GB Flash Module for Vista ReadyBoost	X	X

After-Market Options (availability may vary by region)

		MT	SFF	After-Market Options Part Number
Communications	Wireless LAN			
	HP Wireless A+G PCI Card (North America only)	X	X	EA118AA
	HP Wireless A+G PCI Card (WW except North America)	X	X	PZ928AA
	HP BT450 USB Bluetooth Wireless Printer and PC Adapter	X	X	IPQ639A
	HP 802.11 b/g/n Wireless PCIe x1 card	X	X	FH971AA
	NICs			
	Broadcom NetXtreme Gigabit Ethernet PCIe NIC Card	X	X	EA833AA
	Intel PRO/1000 PT PCIe Gigabit NIC Card	X	X	EH352AA
	Modem			
	Agere 2006 PCI 56K International Modem	X	X	EK694AA
	LSI PCIe x1 Hi-Speed 56K International SoftModem	X	X	FH970AA
Graphics	Single head solutions			
	NVIDIA GeForce 8400 GS 256MB SH PCIe x16 Graphics Card*	X	X	GJ119AA
	ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card	X	X	FS591AV
	Multi head solutions			
	HP DMS59 DVI Dual-head Connector Cable	X	X	DY599A
	HP DVI to DVI Cable	X	X	DL139A
	HP DisplayPort to VGA Adapter	X	X	AS615AA
	ATI Radeon HD 3650 (512MB DH) PCIe x16 Graphics Card	X		KU895AV
	ATI Radeon HD 4550 Dual Head PCIe x16 Graphics Card	X	X	AT042AA
	NVIDIA Quadro NVS 290 256MB DH PCIe x16 Graphics Card	X	X	KG748AA
	NVIDIA GeForce 8400 GS 256MB DH PCIe x1 Graphics Card*	X	X	GJ120AA

* 1GB of system memory required. Graphics cards use part of the total system memory to enhance graphics performance.

After-Market Options (availability may vary by region)

Hard Drives		Serial ATA Hard Drives	X	X	PY276AA
		HP 80-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	PY277AA
		HP 160-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	PY278AA
		HP 250-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	NB505AV
		HP 320-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	PV943A
		HP 500-GB SATA (NCQ/Smart IV) 3.0-Gb/s Hard Drive	X	X	GD443AV
		HP 80-GB SATA (NCQ/Smart III) 10,000 RPM 3.0-Gb/s Hard Drive	X	X	GD437AV
		HP 160-GB SATA (NCDQ/Smart III) 10,000 RPM 3.0-Gb/s Hard Drive	X	X	RY102AA
		HP Removable SATA Hard Drive Enclosure (Frame & Carrier)	X	X	RY103AA
		HP Removable SATA Hard Drive Enclosure (Carrier Only)	X	X	
Input/Output Devices		HP PS/2 Standard Keyboard	X	X	DT527A
		HP USB Standard Keyboard	X	X	DT528A
		HP USB Smartcard Keyboard	X	X	ED707AA
		HP USB Gray Standard Keyboard	X	X	DT529A
		HP 2.4 GHz Wireless Keyboard and Mouse	X	X	NB896AA#xxx
		HP USB 2-Button Laser Mouse	X	X	GW405AA
		HP PS/2 2-Button Optical Scroll Mouse	X	X	EY703AA
		HP USB 2-Button Optical Scroll Mouse	X	X	DC172B
Memory (DIMMs)		PC2-6400 (DDR2, 800 MHz) DIMMs Non-ECC			
		HP 2-GB PC2-6400 (DDR2 800 MHz) DIMM	X	X	AH060AA
		HP 1-GB PC2-6400 (DDR2 800 MHz) DIMM	X	X	AH058AA
		HP 512-MB PC2-6400 (DDR2 800 MHz) DIMM	X	X	AH056AA
Monitors		All HP monitors are supported that accept a graphics output provided by this PC. The LP3065 monitor can be supported by installing a graphics card that supports a dual-link DVI-D output.			
Multimedia		HP USB Powered Speakers	X	X	RD628AA

After-Market Options (availability may vary by region)

Optical Drives	DVD-ROM Drive			
	HP SATA DVD-ROM Drive	X	X	AH047AA
	DVD Writer	X	X	GF343AA
	HP SATA SuperMulti LightScribe DVD Writer Drive	X	X	GF343AA
	Blu-ray Writer	X	X	AR481AA
	HP SATA Blu-ray Writer (carbonite)	X	X	AR482AA
	HP SATA Blu-ray Writer (black)	X	X	AR482AA
Removable Storage	Diskette and Digital Drives			
	HP 1.44-MB External USB Diskette Drive	X	X	DC141B
	HP 1.44-MB Internal Diskette Drive	X	X	AH053AA
	Multimedia	X	X	EM718AA
Security	HP 16-in-1 Media Card Reader with PCI Card	X	X	EM718AA
	Kensington lock	X	X	PC766A
	HP Business PC Security Lock	X	X	PV606AA
	HP ProtectTools Client Security Software including:	X	X	KN740AA
	HP ProtectTools Security Manager			
	BIOS Configuration for HP ProtectTools			
	Credential Manager for HP ProtectTools			
	Device Access Manager for HP ProtectTools			
	Drive Encryption for HP ProtectTools			
Manageability	Embedded Security for HP ProtectTools			
	Java Card Security for HP ProtectTools			
	HP 2007 Wall Mount/Security Sleeve	X		GF344AA
	HP USB Smartcard Keyboard	X	X	ED707AA
	HP Client Configuration Manager, Premium Edition	X	X	T3488AA (use T3489AA for 1000 licenses)
	HP ProtectTools Client Security Software including:	X	X	KN740AA
Altiris	HP ProtectTools Security Manager			
	BIOS Configuration for HP ProtectTools			
	Credential Manager for HP ProtectTools			
	Device Access Manager for HP ProtectTools			
	Drive Encryption for HP ProtectTools			
	Embedded Security for HP ProtectTools			
	Java Card Security for HP ProtectTools			
	Altiris Client Management Suite Level 1	X	X	DR605A (use DR606A for 1000+ licenses)
	Includes:			
	Altiris Deployment Solution			



After-Market Options (availability may vary by region)

Altiris Software Delivery Solution
Altiris Application Management Solution
Altiris Patch Management Solution

Brackets/Stands	HP 2007 SFF Tower Stand	X	GJ118AA
Miscellaneous Accessories	HP 2nd Serial Port Adapter	X	X PA716A
	HP Parallel Port Adapter	X	X KD061AA
	Belken USB to Serial Adapter	X	X EM449AA
	HP FireWire / IEEE 1394 PCI Card	X	X PA997A

Technical Specifications

Unit Environment and Operating Conditions	Microtower	Small Form Factor
General Unit Operating Guidelines		
<ul style="list-style-type: none"> Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range. Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow. Never restrict airflow into the computer by blocking any vents or air intakes. Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air. Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow. If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply. 		
Temperature Range Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F (-30° to 60° C)		
Relative Humidity Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient)		
Maximum Altitude (unpressurized) Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)		
*NOTE: Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.		

	Microtower	Small Form Factor		
Power Supply	300-watt BTX power supply – Passive PFC 115v/230v line switch	300-watt 85% efficient* BTX power supply – Active PFC 115v/230v line switch	240-watt BTX power supply – Active PFC 115v/230v line switch	240-watt 85% efficient* BTX power supply – Active PFC
Operating Voltage Range	90 to 132VAC, or 180 to 264VAC	90 to 264VAC	90 to 132VAC, or 180 to 264VAC	90 to 264VAC
Rated Voltage Range	100 to 127VAC, or 200 to 240VAC	100 to 240VAC	100 to 127VAC, or 200 to 240VAC	100 to 240VAC
Rated Line Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Operating Line Frequency Range	47–63 Hz	47–63 Hz	47–63 Hz	47–63 Hz
Rated Input Current	8A/4A	5A/2.5A	6A/3A	3.5A/1.75
Heat Dissipation	Typical 315 btu/hr (79 kg-cal/hr) Maximum 1575 btu/hr (397 kg-cal/hr)	Typical 270 btu/hr (68 kg-cal/hr) Maximum 1280 btu/hr (322 kg-cal/hr)	Typical 315 btu/hr (79 kg-cal/hr) Maximum 1260 btu/hr (317 kg-cal/hr)	Typical 270 btu/hr (68 kg-cal/hr) Maximum 1025 btu/hr (258 kg-cal/hr)
Power Supply Fan	Variable speed fan	Variable speed fan	Variable speed fan	Variable speed fan
ENERGY STAR 4.0 Compliant		X		X
FEMP Standby Power Compliant (<2W in S5 – Power Off)**	X	X	X	X



Technical Specifications

Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	<4W	<3W	<4W	<3W
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NOTES:

* Energy efficient power supply is a requirement for ENERGY STAR qualification in conjunction with a select range of processors and modules

** Power consumption in the Off/Apparent Off mode is measured and reported with the network interface controller "Wake on LAN" feature disabled in F10 Setup (default is "enabled").

ROM BIOS Information

Key features of the HP BIOS in the dc5850 include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Business desktop computer into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages.
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Security – HP BIOS offers a robust and flexible set of security features to help the system administrator secure their systems from removal of sensitive data, and help prevent access by unauthorized users.
- Tracking and tracing capabilities in case of theft available in select countries (subscription sold separately).
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies to assist in operating the HP Business Desktop computer in any enterprise environment.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (Flashlite), BIOS updates from within Windows (HPQFlash, SSM), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website.

Additional HP BIOS Features

- Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) – Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. Provides power conservation features under Windows XP.
- Ability to mute the internal speaker

Other Features

ACPI-Ready Hardware

Description

Advanced Configuration and Power Management Interface (ACPI).

- Allows the system to wake from a low power mode.
- Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.

SMBIOS Ver. 2.4

System Management BIOS, previously known as DMI BIOS, for system management information

Dual-State Power Button

Power button acts as both an on/off button and suspend-to-sleep button

Technical Specifications

Serviceability Features of System		
Dual Color Power LED on Front of Computer (Indicates Normal Operations and Fault Conditions)		
Diagnostic LED Explanation Table		Number of 1-second red LED blinks followed by 2-second pause, then repeats: 2-processor thermal protection activated 3-processor not installed 4-power supply failure 5-memory error 6-video error 7-PCA failure (ROM detected failure prior to video) 8-invalid ROM, bootblock recover mode
<ul style="list-style-type: none"> ● System/Emergency ROM ● Flash Recovery with Video ● Over-Temp Warning on Screen (Requires IM Agents) ● Restore CD <ul style="list-style-type: none"> ● Flash ROM ● 5 Aux Power LED on System PCA ● Clear Password Jumper ● Clear CMOS Switch <ul style="list-style-type: none"> ● CMOS Battery Holder for easy Replacement ● Processor ZIF Socket for easy Upgrade ● DIMM Connectors for easy Upgrade ● NIC LEDs (integrated) (Green & Amber) 		
Serviceability Features of Chassis		
<ul style="list-style-type: none"> ● Dual Color Power and HD LED - To Indicate Normal Operations and Fault Conditions ● Front power switch 		<ul style="list-style-type: none"> ● Color coordinated cables and connectors ● System memory can be upgraded upgraded on Microtower without removing any internal components <ul style="list-style-type: none"> ● Tool-less Hood Removal (thumbscrews for Microtower, spring-latch for Small Form Factor) ● Tool-less Hard Drive, CD & Diskette Removal
Feature	Description	
ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting and remote control in operating system-absent environments	
Towerable	Product can be oriented as a tower (in addition to desktop orientation)	
Drive Self Tests (DPS)	<ul style="list-style-type: none"> ● Drive Protection System ● A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. ● Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced. ● The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures. 	
DPS Access through F10 Setup during Boot		
SMART IV Technology* (Self-Monitoring, Analysis and Reporting Technology)	<p>Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted</p> <ul style="list-style-type: none"> ● Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count ● By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure 	

Technical Specifications - Audio

High Definition Audio	Type	Integrated
	High Definition Stereo Codec	Yes – 4-channel ADI 1884 codec
	Audio Jacks	Front microphone-In (150-K ohm Input Impedance) Rear Line-In/Microphone input* (150-K ohm Input Impedance, function is configurable by audio driver) Rear Line-Out ** (190 ohms Output Impedance, expects at least a 10-K ohm load) Front Headphone-Out (0.5 Ohm Output Impedance, expects at least a 32 ohm load)
	Multistreaming Capable	Multistreaming can be enabled in the ADI control panel to allow independent audio streams to be sent to/from the front and rear jacks.
	Sampling	8 kHz – 192 kHz
	Wavetable Syntheses (software)	Yes – Uses OS soft wavetable
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W**
	Internal Speaker	Yes; ability to mute internal speaker through F10 Setup
	External Speaker Jack (Line-Out)	Yes**

*Rear Line in audio port is re-taskable as Line-in or Microphone-in.

**Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.

Technical Specifications - Communications

Integrated Broadcom 5754 Gigabit Ethernet	Connector	RJ-45
	Controller	Broadcom 5754 PCI-Express LAN Controller
	Memory	48KB receive and 8KB transmit on chip buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI-E
	Data path width	Single channel, PCI-E
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	1.33 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network transfer mode	Full-duplex
	Network transfer rate	Half-duplex (not available for the 1000BASE-T transceiver) 10BASE-T (half-duplex) 10 Mbps 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 1000BASE-T (full-duplex) 2000 Mbps
Environmental	Operating temperature	32° to 131°F (0° to 55° C)
	Operating humidity	85% at 131° F (55° C)
Management capabilities	ASF 2.0, ACPI, WOL, PXE 2.1, Broadcom mgmt utility	
Alerting	ASF 2.0	

HP Wireless A+G PCI	Dimensions	4.99 x 2.54 x 0.71 in (126.8 x 64.4 x 18.0 mm)
	Weight	0.268 lb (65 g)
	Controller system interface	Atheros AR5414X chipset PCI Spec 2.2
	Network standard	IEEE 802.11a/b/g
	Frequency band	5.1500 to 5.8500 GHz 2.4000 to 2.4835 GHz 2.4465 to 2.4835 GHz (Europe, Middle East, Asia and Asia Pacific - excluding Japan) 2.4000 to 2.4697 GHz (Japan)
	Operating temperature	32° to 140° F (0° to 60° C), operating
	Storage temperature	-4° to 176° F (-20° to 80° C), non-operating
	Humidity	10% to 85% non-condensing
	Operating voltage	5V ± 5%
	Power consumption	Tx/Rx peak 560/250mA @ 3.3V (max.)

Technical Specifications - Communications

Output power (approximately)	15 dBm ±2dB	
Receive sensitivity	-90dBm at 11 Mbps (typical)	
Data transfer rate	Standard rates of 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 and Super AG Mode108-Mbps	
Spreading	DSSS (Direct Sequence Spread Spectrum)	
Security	64(40h) bit, 128(104h) bit, WPA, IEEE802.1X, AES-OCB, AES-CCM, Microsoft PEAP,TKIP, WEP.	
Antenna	External 5dBi antenna	
Throughput	108 Mbps (only with Belkin 54G or above router that supports 108 Mbps speed) 54 Mbps 11 Mbps	200 ft (60.96 m) – Indoor 200 ft (60.96 m) – Indoor 200 ft (60.96 m) – Indoor
Certifications	Wi-Fi certified	
Certifications for use by country	North America: United States, Canada Europe: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom Australia New Zealand	

HP Wireless 802.11 b/g/n PCIe x1 Card	Dimensions (L x H)	3.3 x 4.7 inches (8.5 x 12 cm)
	Weight	0.08 pounds (40 g)
	Controller	Ralink RT2790
	System interface	PCIExpress x1
	Network standard	802.11 b/g/n
	Frequency band	2.400 – 2.497 GHz
	Operating temperature	14° to 149°F, operating (-10° to 65°C, operating)
	Storage temperature	-40° to 176°F, non-operating (-40° to 80°C, non-operating)
	Humidity	10–90% operating 5–95% non-operating
	Operating voltage	3.3V +/- 9% 12V +/- 8%
Power consumption	Platform/WLAN Mode	Power Consumption
	Maximum Power Consumption	10 Watts
	Transmit Only	4 Watts maximum averaged power over 1 second
	Transmit Packet or Active Scanning	1000 mA peak current for 100 microseconds or longer
	Receive Only Mode or Idle without IEEE PSP mode enabled	3 Watts maximum averaged over 1 second



Technical Specifications - Communications

	Idle, with IEEE PSP mode enabled	1.0 Watts maximum averaged over 1 second	
	Transmit Disabled (turned off in software)	50 mW maximum, averaged over 1 second	
	Platform in S3 or S4 (power removed from Low Profile PCI Express Card)	5 mW maximum, averaged over 1 second	
Output power (approximately)	802.11b modes +19 dBm +/- 1.0 dB maximum	802.11g modes +17 dBm +/- 1.0 dB maximum	EWC modes +17 dBm +/- 1.0 dB maximum (total power in all transmit chains)
Receive sensitivity	Mode 802.11b 802.11b 802.11g 802.11g 802.11g 802.11g EWC (2.4 GHz) EWC (2.4 GHz) EWC (2.4 GHz) EWC (2.4 GHz) EWC (2.4 GHz) EWC (2.4 GHz)	Data rate 1 Mbps 11 Mbps 6 Mbps 18 Mbps 48 Mbps 54 Mbps 6.5 Mbps 54 Mbps 81 Mbps 162 Mbps 270 Mbps 300 Mbps	Sensitivity -94 dBm -85 dBm -91 dBm -85 dBm -75 dBm -72 dBm -87 dBm -82 dBm -78 dBm -74 dBm -68 dBm -64 dBm
Data transfer rate	Data Rate (MCS) 1 Mbps (802.11 b) 2 Mbps (802.11 b) 5.5 Mbps (802.11 b) 11 Mbps (802.11 b) 12 Mbps (802.11 g) 18 Mbps (802.11 g) 24 Mbps (802.11 g) 36 Mbps (802.11 g) 48 Mbps (802.11 g) 54 Mbps (802.11 g) 6.5 Mbps (20 MHz EWC) 13 Mbps (20 MHz EWC) 19.5 Mbps (20 MHz EWC) 26 Mbps (20 MHz EWC) 39 Mbps (20 MHz EWC) 52 Mbps (20 MHz EWC)	Minimum Throughput 700 kbps 1.4 Mbps 3.5 Mbps 5.9 Mbps 6 Mbps 9 Mbps 12 Mbps 18 Mbps 21 Mbps 22.5 Mbps 4.5 Mbps 9 Mbps 13.5 Mbps 18 Mbps 27 Mbps 36 Mbps	

Technical Specifications - Communications

	58.5 Mbps (20 MHz EWC)	40 Mbps
	65 Mbps (20 MHz EWC)	45 Mbps
	78 Mbps (20 MHz EWC)	54 Mbps
	104 Mbps (20 MHz EWC)	72 Mbps
	117 Mbps (20 MHz EWC)	81 Mbps
	130 Mbps (20 MHz EWC)	91 Mbps
	13.5 Mbps (40 MHz EWC)	8 Mbps
	27 Mbps (40 MHz EWC)	16 Mbps
	40.5 Mbps (40 MHz EWC)	24 Mbps
	54 Mbps (40 MHz EWC)	32 Mbps
	81 Mbps (40 MHz EWC)	48 Mbps
	108 Mbps (40 MHz EWC)	64 Mbps
	121.5 Mbps (40 MHz EWC)	72 Mbps
	135 Mbps (40 MHz EWC)	81 Mbps
Security	<ul style="list-style-type: none">IEEE and WiFi compliant 64 / 128 bit WEP encryptionAES: CCM802.1x authenticationWPA: 802.1x, WPA-PSK and TKIPWPA2 certificationIEEE 802.11iCisco Certified Extensions, all versions through V5	
Antenna	HP part number 497792-001	
Certifications	Wi-Fi certified	
Certifications for use by country	United States, Canada, Peru, Taiwan	
OS support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. Red Hat Linux 7.2, Linux 7.3 and Red Hat Enterprise Linux 3	
Option kit contents	<p>* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor. For Windows Vista system requirements, visit: http://www.windowsvista.com/systemrequirements.</p>	
	PCIe x1 card with full height bracket, rf antenna, separate low profile bracket, software CD and warranty.	

Technical Specifications - Communications

2006 Agere PCI 56K
International SoftModem

	Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless
	NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.	
	Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/ 9,600/7,200/4,800/2,400/1,200/300
	Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
	Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
	Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V.17, V.29, V.27ter, and V.21 Channel 2
	Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
	Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
	Upgradeability	Driver upgradeable for future enhancements
	Video	ITU-T V.80 video ready interface
	Other	TIA/EIA 602 standard AT command set
		Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface
		Optional ring wakeup signal
	Operating Temperature	32° to 158° F (0° to 70° C)
	Operating Humidity	20% to 90%, non-condensing
	Power	Requires a 3.3-V auxiliary power rail on PCI bus
		Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
	Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
	Dimensions (L X H)	Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
	Connection	Single RJ-11 connector
	Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
	Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
	EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
	Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
	Health	Bare PCB material compliant to 94V-0 or better (marked as such)
	Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

LSI PCIe x1 56K

Data Transmission

Technology speeds: 56,000 Kbps maximum downstream data, controllerless



Technical Specifications - Communications

International SoftModem

NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.

Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
Power Management	PCI Bus Power Management Interface Specification (PCI-PM) Revision 1.2, Appendix A. D0, D3hot, and D3cold. Wake on Ring state when in D3cold. If the power management event (PME) feature is enabled in D3cold, a modem can wake the system via WAKE# (WAKEN) or beacon. Meets PCI Express 1.1 standard.
Upgradeability	Driver upgradeable for future enhancements
Video	ITU-T V.80 video ready interface
Other	TIA/EIA 602 standard AT command set
	Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface
	Optional ring wakeup signal
Operating Temperature	32° to 158° F (0° to 70° C)
Operating Humidity	20% to 90%, non-condensing
Power	Requires a 3.3-V auxiliary power rail on PCI express bus
	Uses only one PCI express load (i.e., one grant/request pair), one shared IRQ, one electrical load
Chipset	LSI SV92EX – Integrated PCI interface with 3.3-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI express low profile specifications—6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
Connection	Single RJ-11 connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Other	The SV92EX device is packaged in a 32-pin micro leadless chip carrier (MLCC). The SV92EX is fully compliant with the PCI Express revision 1.1 specification. WHQL approved; ASPM compliant.

Technical Specifications - Graphics

Integrated AMD DX10 graphics	Bus Type	PCIe x16
	Memory	Variable and User selectable in BIOS settings
	Controller Clock Speed	400MHz
	Overlay Planes	1
	Maximum Color Depth	32 bpp
	Maximum Vertical Refresh Rate	85Hz
	Multi-display Support	Yes
	Graphics/Video API Support	DX10, OpenGL 2.0
	Integrated DVI-D connector	Compliant with DDWG (Digital Display Working Group) and VESA specifications for a single-link digital DVI (DVI-D) connector.
	Display Devices Supported	HP L1530 HP L1740 HP L1755 HP L1940 HP L1955 HP L2035 HP L2335
Resolutions Supported	Resolution	Maximum Refresh Rate (Hz)
		Analog Connection Digital Connection
	640x480	85 60
	800x600	85 60
	1024x768	85 60
	1280x720	85 60
	1280x1024	85 60
	1440x900	75 60
	1600x1200	85 60
	1680x1050	75 60
	1920x1080	85 60-R
	1920x1200	85 60-R
	1920x1440	85 N/A
	2048x1536	75 N/A

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

Technical Specifications - Graphics

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller	Bus type	PCI Express (x16 lanes)										
	Maximum vertical refresh rate	85 Hz										
	Display support	Integrated 400 MHz RAMDAC										
	Display max resolution	2048 x 1536 (analog), 2560 x 1600 (digital)										
	Input/Output connectors	DVI-I (DVI port supports dual-link and HDCP) TV-out (4 pin S-video)										
	Board display options	DVI-I + TV DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector) DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle) TV connector is a 4-pin mini-DIN S-video connector										
	Board configuration	<table border="0"> <thead> <tr> <th>Specification</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Graphics Chip</td> <td>NVIDIA P413-260</td> </tr> <tr> <td>Core clock</td> <td>460 MHz</td> </tr> <tr> <td>Memory clock</td> <td>200 MHz</td> </tr> <tr> <td>Frame buffer</td> <td>256 MB DDR2</td> </tr> </tbody> </table>	Specification	Description	Graphics Chip	NVIDIA P413-260	Core clock	460 MHz	Memory clock	200 MHz	Frame buffer	256 MB DDR2
Specification	Description											
Graphics Chip	NVIDIA P413-260											
Core clock	460 MHz											
Memory clock	200 MHz											
Frame buffer	256 MB DDR2											
	Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish										
	System memory	1GB of system memory required										
	Core power	25 W (Max board power)										

NVIDIA GeForce 8400 GS (256 MB SH) PCIe x16 Graphics Controller display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

Technical Specifications - Graphics

* Only supported when using a dual-link DVI or DP connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card	Bus type	PCI Express (x16 lanes)										
	Maximum vertical refresh rate	85 Hz										
	Display support	Integrated 400 MHz RAMDAC										
	Display max resolution	2560 x 1600 digital, 2048 x 1536 analog										
	Board display options	Supports two displays via included DMS-59 to dual VGA cable or 2 DVI monitors via optional DMS-59 to dual DVI cable kit part number: DL139A. 4-pin mini-DIN S-video connector for TV output										
	Board configuration	<table><thead><tr><th>Specification</th><th>Description</th></tr></thead><tbody><tr><td>Graphics Chip</td><td>RV610</td></tr><tr><td>Core clock</td><td>650 MHz</td></tr><tr><td>Memory clock</td><td>500 MHz</td></tr><tr><td>Frame buffer</td><td>256 MB DDR2, 128 bit wide</td></tr></tbody></table>	Specification	Description	Graphics Chip	RV610	Core clock	650 MHz	Memory clock	500 MHz	Frame buffer	256 MB DDR2, 128 bit wide
Specification	Description											
Graphics Chip	RV610											
Core clock	650 MHz											
Memory clock	500 MHz											
Frame buffer	256 MB DDR2, 128 bit wide											
	Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish										
	System memory	1GB of system memory required										
	Core power	21 W										
	Compliance standards	EMC Emissions: a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Use b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment c) Canadian Standard ICES-003 is equivalent to CISPR22 d) Taiwanese Standard BSMI e) Japanese VCCI f) Australian C-Tick g) Korean (MIC) EMC Immunity: CISPR 24:1997/EN 55024:1998 – Information Technology Equipment - Immunity Characteristics – Limits and Methods of Measurement.										

ATI Radeon HD 2400XT (256MB DH) PCIe Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

Technical Specifications - Graphics

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	N/A

ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card	Bus type	PCI Express (x16 lanes)
	Maximum vertical refresh rate	85 Hz
	Display support	Integrated 400 MHz RAMDAC
	Display max resolution	2560 x 1600 digital, 2048 x 1536 analog
	Board display options	Supports two displays via the DisplayPort and DVI connectors
	Board configuration	Specification Description
		Graphics Chip RV620
		Core clock 750 MHz
		Memory clock 500 MHz
	Frame buffer	256 MB DDR2, 64 bit wide
	Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish
	Operating systems support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows XP Professional or Windows XP Home 32*.

* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: <http://www.windowsvista.com/upgradeadvisor>. For Windows Vista system requirements, visit: <http://www.windowsvista.com/systemrequirements>.

Linux x86 and x86_64 distributions using XFree86 or X.Org**.

** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website: <http://www.hp.com/wwsolutions/linux/products/clients/> for support



Technical Specifications - Graphics

	information.
Core power	22 W (max)
Dimensions (H x D)	2.71 in x 6.60 in (68.90 mm x 167.65 mm)
Weight	0.30 lb (134.3 g)
Option kit contents	<ul style="list-style-type: none">• ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card with full height bracket attached• DVI to VGA adapter• Software CD with graphics drivers• Low profile bracket to convert the card for using in a low profile chassis• Warranty documentation
Compliance standards	<p>EMC Emissions:</p> <ul style="list-style-type: none">a) FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Useb) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipmentc) Canadian Standard ICES-003 is equivalent to CISPR22d) Taiwanese Standard BSMIe) Japanese VCCIf) Australian C-Tickg) Korean (MIC) <p>EMC Immunity:</p> <p>CISPR 24:1997/EN 55024:1998 - Information Technology Equipment – Immunity Characteristics - Limits and Methods of Measurement.</p>

ATI Radeon HD 3470 (256MB SH) PCIe x16 Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	60*

* Only supported when using a dual-link DVI or DP connection

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections

ATI Radeon HD

Input/Output

DMS-59



Technical Specifications - Graphics

4550 DH PCIe x16 connectors	S-video connector
Graphics Card	Board display options
Board configuration	Specification
	Graphics Chip
	Core clock
	Memory clock
	Frame buffer
Bus type	PCI Express (x16 lanes)
Maximum vertical refresh rate	85 Hz
Display support	Integrated 400 MHz RAMDAC
Display max resolution	1900 x 1200 digital, 2048 x 1536 analog

ATI Radeon HD 4550 DH PCIe x16 Graphics Card display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP.

Resolution	Maximum Refresh Rate (Hz)	
	Analog Connection	Digital Connection
640x480	85	60
800x600	85	60
1024x768	85	60
1280x720	85	60
1280x1024	85	60
1440x900	75	60
1600x1200	85	60
1680x1050	75	60
1920x1080	85	60-R
1920x1200	85	60-R
1920x1440	85	N/A
2048x1536	75	N/A
2560x1600	N/A	N/A

NOTE: 60-R denotes reduced blanking timings are used on single-link DVI connections and may be used with other digital connections.

Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish
Operating systems support	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows XP Professional or Windows XP Home 32*.

* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: <http://www.windowsvista.com/upgradeadvisor>. For Windows Vista system requirements, visit: <http://www.windowsvista.com/systemrequirements>.

Technical Specifications - Graphics

Linux x86 and x86_64 distributions using XFree86 or X.Org**.

** Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website:
<http://www.hp.com/wwsolutions/linux/products/clients/> for support information.

Core power	21 W
Option kit contents	<ul style="list-style-type: none">● ATI Radeon HD 4550 DH PCIe x16 Graphics Card with full height bracket attached● DMS 59 to dual VGA Y cable● Software CD with graphics drivers● Low profile bracket to convert the card for using in a low profile chassis● Warranty documentation
Compliance standards	<p><u>EMC Emissions:</u></p> <ul style="list-style-type: none">a) FCC Part 15, Subpart B - Unintentional Radiators, Class B Computing Devices for Home & Office Useb) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipmentc) Canadian Standard ICES-003 is equivalent to CISPR22d) Taiwanese Standard BSMIe) Japanese VCCIf) Australian C-Tickg) Korean (KCC) <p><u>EMC Immunity:</u></p> <p>CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.</p>

HP DisplayPort to VGA Adapter	Connectors	DisplayPort and VGA connector
	Adapter length	8 in (20 cm)
	Adapter weight	.1 lbs (.06 kg)
	Option kit contents	HP DisplayPort to VGA Adapter, documentation
	Maximum vertical refresh rate	85 Hz
	Display support	162 MHz RAMDAC
	Display max resolution	1600x1200

Technical Specifications - Graphics

HP DisplayPort to VGA adapter display resolutions and refresh rates

NOTE: Other resolutions may be available but are not recommended as they may not have been tested and qualified by HP. Using the HP DisplayPort to VGA Adapter may require an update to the graphics driver installed on your system. To install the most up-to-date graphics driver go to: www.hp.com.

Resolution	Max refresh rate
640x480	85
800x600	85
1024x768	85
1280x720	85
1280x1024	85
1440x900	75
1600x1200	60
1680x1050	60
1920x1080	60-R
1920x1200	60-R

NOTE: 60-R denotes reduced blanking timings are used. Not all monitors support reduced blanking timing.

Technical Specifications - Hard Drives

7200 RPM Serial ATA Hard Drives	500-GB	Capacity	500,107,862,016 bytes
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (3.0 Gb/s)
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
		Buffer	16 MB
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track 2.0 ms Average 11 ms Full-Stroke 21 ms
		Rotational Speed	7,200 rpm
		Logical Blocks	976,773,168
		Operating Temperature	41° to 131° F (5° to 55° C)
320-GB		Capacity	320,072,933,376 bytes
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (3.0 Gb/s)
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
		Buffer	16 MB
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track 2.0 ms Average 11 ms Full-Stroke 21 ms
		Rotational Speed	7,200 rpm
		Logical Blocks	625,142,448
		Operating Temperature	41° to 131° F (5° to 55° C)
250-GB		Capacity	250,059,350,016 bytes
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (3.0 Gb/s)
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
		Buffer	8 MB
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track 2.0 ms Average 11 ms Full-Stroke 21 ms
		Rotational Speed	7,200 rpm

Technical Specifications - Hard Drives

160-GB	Logical Blocks	488,397,168
	Operating Temperature	41° to 131° F (5° to 55° C)
	Capacity	160,041,885,696 bytes
	Height	1 in (2.54 cm)
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
	Interface	Serial ATA (3.0 Gb/s)
	Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
	Buffer	8 MB
80-GB	Seek Time (typical reads, includes controller overhead, including settling)	Single Track 2.0 ms Average 11 ms Full-Stroke 21 ms
	Rotational Speed	7,200 rpm
	Logical Blocks	312,581,808
	Operating Temperature	41° to 131° F (5° to 55° C)
	Capacity	80,026,361,856 bytes
	Height	1 in (2.54 cm)
	Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
	Interface	Serial ATA (3.0 Gb/s)
	Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s
	Buffer	8 MB
	Seek Time (typical reads, includes controller overhead, including settling)	Single Track 2.0 ms Average 11 ms Full-Stroke 21 ms
	Rotational Speed	7,200 rpm
	Logical Blocks	156,301,488
	Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Hard Drives

10,000 RPM Serial ATA Hard Drives	160-GB	Capacity	160,041,885,696 bytes
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled
		Synchronous Transfer Rate (Maximum)	Up to 1.5 Gb/s
		Cache	16 Mbytes
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track 0.3 ms Average 4.6 ms Full-Stroke 10.2 ms
		Rotational Speed	10,000 RPM
		Logical Blocks	312,581,808
		Operating Temperature	41° to 131° F (5° to 55° C)
80-GB		Capacity	80,026,361,856 bytes
		Height	1 in (2.54 cm)
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)
		Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled
		Synchronous Transfer Rate (Maximum)	Up to 1.5 Gb/s
		Cache	16 Mbytes
		Seek Time (typical reads, includes controller overhead, including settling)	Single Track 0.3 ms Average 4.6 ms Full-Stroke 10.2 ms
		Rotational Speed	10,000 RPM
		Logical Blocks	156,301,488
		Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Input/Output Devices

PS/2 Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
	Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)	
	Weight	2 lb (0.9 kg) minimum	
	Operating voltage	+ 5VDC ± 5%	
	Power consumption	50-mA maximum (with three LEDs ON)	
	System interface	PS/2 6-pin mini din connector	
	ESD	CE level 4, 15-kV air discharge	
	EMI – RFI	Conforms to FCC rules for a Class B computing device	
	Microsoft PC 99 – 2001	Functionally compliant	
	Languages	38 available	
Mechanical	Keycaps	Low-profile design	
	Switch actuation	55-g nominal peak force with tactile feedback	
	Switch life	20 million keystrokes (using Hasco modified tester)	
	Switch type	Contamination-resistant switch membrane	
	Key-leveling mechanisms	For all double-wide and greater-length keys	
	Cable length	6 ft (1.8 m)	
	Microsoft PC 99 – 2001	Mechanically compliant	
	Acoustics	43-dBA maximum sound pressure level	
	Operating temperature	50° to 122° F (10° to 50° C)	
	Non-operating temperature	-22° to 140° F (-30° to 60° C)	
Environmental	Operating humidity	10% to 90% (non-condensing at ambient)	
	Non-operating humidity	20% to 80% (non-condensing at ambient)	
	Operating shock	40 g, six surfaces	
	Non-operating shock	80 g, six surfaces	
	Operating vibration	2-g peak acceleration	
	Non-operating vibration	4-g peak acceleration	
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence	
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence	
	Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC	
	Ergonomic compliance	ANSI HFS 100, ISO 9241-4, and TUVGS	

Technical Specifications - Input/Output Devices

HP USB 2-Button Laser Mouse	Scroll Wheel	24
	Maximum Rotation Speed	48 rats/sec
	Switch Type	wheel
	Switch Life	Button – 3,000,000 Wheel – 1,000,000 times Tilt switch – 500,000 times
Environmental	Operating Temperature	32° to 104° F (0° to 40° C)
	Non-operating Temperature	-4° to 140° F (-20° to 60° C)
	Operating Humidity	10% to 90% (non-condensing at ambient)
	Non-operating Humidity	20% to 80% (non-condensing at ambient)
	Operating Shock	40 g, six surfaces
	Non-operating Shock	80 g, six surfaces
	Operating Vibration	2-g peak acceleration
	Non-operating Vibration	4-g peak acceleration
	Operating Voltage	+ 5VDC ± 5%
	Power Consumption	
Electrical	MTBF	> 150,000 hrs
	ESD	IEC-61000-4-2 criteria B, Contact discharge: +/- 4kV, Air discharge: +/- 8kV
	EMI-RFI	FCC Class B
	PC98	PC 99 Compliant
	Resolution	800dpi
Mechanical	Tracking Speed	25 cm/sec
	Acceleration	0.5mm
	Switch Actuation	0.6N (60gf)
	Switch Life	Button – 3,000,000 Wheel – 1,000,000 times Tilt switch – 500,000 times
	Cable Length	1850mm
Regulatory Approvals	PC98-99	PC99 compliant
	UL60950-1, UL 94, UL 746 (A-E), UL 796	
	TUV/GS: EN 60950-1, EN 60825-1	
	FCC Class B, UL 1950, cUL, TUV GS, CE, C-tick, VCCI, BSMI, RRL	

Technical Specifications - Input/Output Devices

HP PS/2 Optical Scroll Mouse	Dimensions (H x L x W)	3.95 x 6.21 x 11.7 cm (1.56 x 2.44 x 4.61 in)																				
	Weight	4.44 oz (126 g)																				
	Environmental	<table><tr><td>Operating temperature</td><td>32° to 104°F (0° to 40° C)</td></tr><tr><td>Non-operating temperature</td><td>-4° to 140°F (-20° to 60° C)</td></tr><tr><td>Operating humidity</td><td>10% to 90% (non condensing at ambient)</td></tr><tr><td>Non-operating humidity</td><td>10% to 90% non condensing</td></tr><tr><td>Operating shock</td><td>40 g, 6 surfaces</td></tr><tr><td>Non-operating shock</td><td>80 g, 6 surfaces</td></tr><tr><td>Operating vibration</td><td>2 g peak acceleration</td></tr><tr><td>Non-operating vibration</td><td>4 g peak acceleration</td></tr><tr><td>Drop (out of box)</td><td>80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face</td></tr></table>	Operating temperature	32° to 104°F (0° to 40° C)	Non-operating temperature	-4° to 140°F (-20° to 60° C)	Operating humidity	10% to 90% (non condensing at ambient)	Non-operating humidity	10% to 90% non condensing	Operating shock	40 g, 6 surfaces	Non-operating shock	80 g, 6 surfaces	Operating vibration	2 g peak acceleration	Non-operating vibration	4 g peak acceleration	Drop (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face		
Operating temperature	32° to 104°F (0° to 40° C)																					
Non-operating temperature	-4° to 140°F (-20° to 60° C)																					
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Operating vibration	2 g peak acceleration																					
Non-operating vibration	4 g peak acceleration																					
Drop (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face																					
	Electrical	<table><tr><td>Operating voltage</td><td>5 VDC ± 10%</td></tr><tr><td>Power consumption</td><td>100mA</td></tr><tr><td>System consumption</td><td>PS/2 mini-din connector</td></tr><tr><td>ESD</td><td>CE level 4, 15 kV air discharge</td></tr><tr><td>EMI-RFI</td><td>Conforms to FCC rules for a Class B computing device</td></tr></table>	Operating voltage	5 VDC ± 10%	Power consumption	100mA	System consumption	PS/2 mini-din connector	ESD	CE level 4, 15 kV air discharge	EMI-RFI	Conforms to FCC rules for a Class B computing device										
Operating voltage	5 VDC ± 10%																					
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System consumption	PS/2 mini-din connector																					
ESD	CE level 4, 15 kV air discharge																					
EMI-RFI	Conforms to FCC rules for a Class B computing device																					
	Mechanical	<table><tr><td>Microsoft PC99 – 2001</td><td>Functionally compliant</td></tr><tr><td>Resolution</td><td>400 ± 20% DPI</td></tr><tr><td>Tracking speed</td><td>10 in/s (25.4 cm/s) maximum</td></tr><tr><td>Acceleration</td><td>100 in/s/s (2.54 m/s/s)</td></tr><tr><td>Switch actuation</td><td>61 g nominal peak force</td></tr><tr><td>Switch life</td><td>3,000,000 operations (using Hasco modified tester)</td></tr><tr><td>Switch type</td><td>Low force micro-switches</td></tr><tr><td>Tracking mechanism life</td><td>155 mi (250 km) at average speed of 10 in/s</td></tr><tr><td>Cable length</td><td>6 ft (1.8 m)</td></tr><tr><td>Microsoft PC99 – 2001</td><td>Mechanically compliant</td></tr></table>	Microsoft PC99 – 2001	Functionally compliant	Resolution	400 ± 20% DPI	Tracking speed	10 in/s (25.4 cm/s) maximum	Acceleration	100 in/s/s (2.54 m/s/s)	Switch actuation	61 g nominal peak force	Switch life	3,000,000 operations (using Hasco modified tester)	Switch type	Low force micro-switches	Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s	Cable length	6 ft (1.8 m)	Microsoft PC99 – 2001	Mechanically compliant
Microsoft PC99 – 2001	Functionally compliant																					
Resolution	400 ± 20% DPI																					
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Switch type	Low force micro-switches																					
Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s																					
Cable length	6 ft (1.8 m)																					
Microsoft PC99 – 2001	Mechanically compliant																					
Scroll wheel	Width	8 mm																				
	Diameter	1.01 in (25.6 mm)																				
	Maximum rotation speed	48 rats/sec																				
	Switch type	Light force micro-switch																				
	Switch life	1 million operations																				
	Mechanical life	Minimum 200,000 revolutions																				
Regulatory approvals	Compliant	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC																				

Technical Specifications - Input/Output Devices

HP USB Optical Scroll Mouse	Dimensions (H x L x W)	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	Weight	0.27 lb (0.12 kg)
	Cable length	72.8 in (185 cm)

Technical Specifications - Optical Storage

HP 16x SATA Blu-ray Writer	Form Factor	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	50 GB DL or 25 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 7.5 in (15.0 x 4.4 x 19.0 cm)	
	Weight (max)	2.0 lb (907g)	
Write speed	BD-R	Single-layer	Double-layer
	BD-RE	2x, 4x CLV, 6x CAV	2x, 4x CLV
	DVD-R	2x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2x, 4x CLV
	DVD-RW	2x, 4x CLV, 6x CAV	Not supported
	DVD+R	2.4x, 4x CLV, 8x ZCLV, 8x, 12x PCAV, 16x CAV	2.4x, 4x CLV
	DVD+RW	2.4x, 4x CLV, 8x ZCLV	Not supported
	DVD-RAM	2x, 3x CLV, 3-5x PCAV	
	CD-R	8x, 16x CLV, 24x, 32x PCAV, 40x CAV	
	CD-RW	4x, 10x, 16x CLV, 24x ZCLV	
	Read speeds	Single-layer	Double-layer
Read speeds	BD-ROM	6x CAV	4.8x CAV
	BD-R	6x CAV	4.8x CAV
	BD-RE (SL/DL)	4.8x CAV	4.8x CAV
	DVD-ROM	16x CAV	8x CAV
	DVD-R	12x CAV	8x CAV
	DVD-RW	10x CAV	Not support
	DVD+R	12x CAV	8x CAV
	DVD+RW	10x CAV	Not support
	BDMV (AACS Compliant Disc)	4.8x CAV	
	DVD-RAM	2x, 3x CLV, 3x-5x PCAV	
	DVD-Video (CSS Compliant Disc)	8x CAV	
	CD-R/RW/ROM	40x / 40x / 40x CAV	
Sustained Transfer rate	CD-DA (DAE)	32x CAV	
	80 mm CD	16x CAV	
	BD-ROM	215.79 Mbits/s (6x) max.	
	DVD-ROM	16.62 Mbytes/s (16x) max.	
Burst Transfer rate	CD-ROM	6,000 KB/s (40x) max.	
		1.5Gbps bits/s (10b side)	
		1.2Gbps bits/s (8b side)	

Technical Specifications - Optical Storage

Multimedia MPC-3 compliant	Yes
Access times (typical reads, including setting)	Random DVD: < 140 ms (typical), CD: < 125 ms (typical) Full Stroke DVD: < 250 ms (seek), CD: < 210 ms (seek)
Power	Source SATA DC power receptacle
	DC Power Requirement 5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current 5 VDC -1000 mA typical, 1600 mA maximum 12 VDC -600 mA typical, 1400 mA maximum
Environmental (all conditions non-condensing)	Temperature (operating) 41° to 122° F (5° to 50° C) Relative Humidity (operating) 10% to 90% Maximum Wet Bulb Temperature (operating) 86° F (30° C)
Operating systems supported	Windows Vista Business 64*, Windows Vista Business 32*, Windows Vista Home Basic 32*, Windows 2000, Windows XP Professional or Windows XP Home 32*. No driver is required for this device. Native support is provided by the operating system.
Option kit contents	HP 16x SATA Blu-ray Writer drive, the appropriate SATA cable for the drive, LightScribe software, Roxio Creator Business HD version 9, Corel WinDVD BD Software, installation guide, and DVD+R media.

* Certain Windows Vista product features require advanced or additional hardware. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: <http://www.windowsvista.com/upgradeadvisor>. For Windows Vista system requirements, visit: <http://www.windowsvista.com/systemrequirements>.

HP SATA SuperMulti LightScribe DVD Writer Drive	Height	5.25-inch, half-height, tray-load
	Orientation	Either horizontal or vertical
	Interface type	SATA/ATAPI
	Disc capacity	8.5 GB DL or 4.7 GB standard
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)
	Weight (max)	2.6 lb (1.2 kg)
	Write speeds	DVD-RAM Up to 12X DVD+R Up to 16X DVD+RW Up to 8X DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-R Up to 16X DVD-RW Up to 6X CD-R Up to 48X

Technical Specifications - Optical Storage

Read speeds	CD-RW DVD-RAM DVD+RW, DVD-RW, DVD+R DL, DVD-R DL DVD-ROM DL DVD-ROM, DVD+R, DVD-R CD-ROM, CD-R CD-RW	Up to 32X Up to 12X Up to 8X Up to 8X Up to 16X Up to 48X Up to 32X
Access time (typical reads, including settling)	Random Full Stroke	DVD: < 140 ms (typical), CD: < 125 ms (typical) DVD: < 250 ms (seek), CD: < 210 ms (seek)
Power	Source DC Power Requirement	SATA DC power receptacle 5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum) 12 VDC (< 600 mA typical, 1400 mA maximum)
Environmental conditions (operating – non-condensing)	Temperature Relative Humidity Maximum Wet Bulb Temperature	41° to 122° F (5° to 50° C) 10% to 90% 86° F (30° C)

SATA CD-RW/DVD-ROM Combo Drive	Height	5.25-inch, half-height, tray-load
	Orientation	Either horizontal or vertical
	Interface type	SATA/ATAPI
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)
	Weight (max)	2.6 lb (1.2 kg)
	Write speeds	CD-R CD-RW
	Read speeds	DVD+R/-R/+RW/-RW/+R DL /-R DL DVD-ROM CD-ROM, CD-R CD-RW
		Up to 48X Up to 32X Up to 8X Up to 16X Up to 48X Up to 32X
	Access time (typical reads, including settling)	Random Full Stroke
		DVD: < 140 ms (typical), CD: < 125 ms (typical) DVD: < 250 ms (typical), CD: < 210 ms (typical)
	Power	Source



Technical Specifications - Optical Storage

Environmental (all conditions non-condensing)	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum) 12 VDC (< 600 mA typical, < 1400 mA maximum)
	Temperature	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 90%
Maximum Wet Bulb Temperature	Maximum Wet Bulb	86° F (30° C)
	Temperature	

SATA DVD-ROM Drive	Height	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Read speeds	DVD+R/-R/+RW/-RW/+R DL /-R DL	Up to 8X
		DVD-ROM	Up to 16X
		DVD-RAM	Up to 4X
		CD-ROM, CD-R	Up to 48X
Removable Storage – Media Compatibility – DVD-ROM	CD-RW	Up to 32X	
	Media	Read	Write
	CD-ROM	Yes	No
	CD-R	Yes	No
	CD-RW	Yes	No
	DVD-ROM	Yes	No
	DVD-ROM DL	Yes	No
	DVD-RAM	Yes	No
	DVD+R	Yes	No
	DVD+R DL	Yes	No
Access times (typical reads, including setting)	DVD+RW	Yes	
	DVD-R	Yes	
	DVD-RW	Yes	
	DVD-R DL	Yes	
	Random	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
Full Stroke		DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	Cache Buffer	2 MB (minimum)	

Technical Specifications - Optical Storage

	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)
Power	Source	SATA DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC – <1000 mA typical, < 1600 mA maximum 12 VDC –< 600 mA typical, < 1400 mA maximum
Environmental (all conditions non-condensing)	Temperature	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 90%
	Maximum Wet Bulb Temperature	86° F (30° C)

Technical Specifications - Removable Storage

HP 16-in-1 Media Card Reader	USB Interface	USB 2.0 High-speed device
	Advance protocol support	Supports hardware ECC (Error Correction Code) function <ul style="list-style-type: none">• Supports hardware CRC (Cyclic Redundancy Check) function• Supports MS 4-bit parallel transfer mode• Supports MS-PRO 4-bit parallel transfer mode• Supports SD 4-bit parallel transfer mode• Supports high-speed 50-MHz SD 4-bit card (version 1.1)• Support high-speed 52-MHz MMC 8-bit card
	Supported media type with card adapter	<ul style="list-style-type: none">• MicroSD (T-Flash)• Memory Stick Micro
	Mechanical	
	Environmental	Operational Environmental Extremes Test Parameters/Conditions – Power applied, unit operating on system ±5% nominal supply voltage. 10°C 10% R.H. = 24 hours 10°C 90% R.H. = 24 hours 20°C 90% R.H. = 24 hours 30°C 90% R.H. = 24 hours 40°C 90% R.H. = 24 hours 50°C 90% R.H. = 24 hours 50°C 10% R.H. = 24 hours
		Storage Environmental Extremes Test Parameters/Conditions 60°C @ 80% R.H. for 96 hours -30°C @ 20% R.H. for 48 hours No power applied Delta °C < 1.0°C/min Delta % R.H. < 1.5% R.H./min
Approvals		USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2 FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T

HP 22-in-1 Media Card Reader (with 1394 port)	USB Interface	USB 2.0 High-speed interface
		NOTE: Requires the USB cable to be connected to the internal USB 2.0 port or a USB 2.0 PCI card.
	1394 Interface	Two IEEE-1394a external ports; 1 IEEE-1394a internal port (connects to the pass through cable on the media card reader)
	Advance protocol support	<ul style="list-style-type: none">• Supports hardware ECC (Error Correction Code) function• Supports hardware CRC (Cyclic Redundancy Check) function• Supports MS 4-bit parallel transfer mode• Supports MS-PRO 4-bit parallel transfer mode• Supports MS PRO-HG Duo 4-bit parallel transfer mode• Supports SD 4-bit parallel transfer mode• Supports high-speed 50Mhz SD 4-bit card (version 2.0)• Supports high-speed 52Mhz MMC 8-bit card (version 4.2)

Technical Specifications - Removable Storage

Supported media type	<ul style="list-style-type: none">● Supports CF v4.0 with PIO mode 6 and Ultra DMA mode● CompactFlash Type I● CompactFlash Type II● Microdrive● MultiMediaCard (MMC)● Reduced Size MultiMediaCard (RS MMC)● MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC)● Reduced Size MultiMediaCard 4.2 (MMC Mobile, including MMC Mobile HC)● Secure Digital Card (SD)● Secure Digital High Capacity (SDHC)● miniSD● miniSD High Capacity● Micro SD (T-Flash)● Micro SD HC● Memory Stick● Memory Stick Select● Memory Stick Duo (MS Duo)● Memory Stick PRO (MS PRO)● Memory Stick PRO Duo (MS PRO Duo)● Memory Stick PRO-HG Duo● MagicGate Memory Stick (MG)● MagicGate Memory Stick Duo● xD-Picture Card
Supported media type with card adapter	<ul style="list-style-type: none">● Memory Stick Micro (M2)● MMC Micro
Environmental	<p>Operational Environmental Extremes</p> <p>Test Parameters/Conditions - Power applied, unit operating on system $\pm 5\%$ nominal supply voltage.</p> <p>10°C 10% R.H. = 24 hours 10°C 90% R.H. = 24 hours 20°C 90% R.H. = 24 hours 30°C 90% R.H. = 24 hours 40°C 90% R.H. = 24 hours 50°C 90% R.H. = 24 hours 50°C 10% R.H. = 24 hours</p> <p>Storage Environmental Extremes</p> <p>Test Parameters/Conditions</p> <p>140°F (60°C) @ 80% R.H. for 96 hours -22°F (-30°C) @ 20% R.H. for 48 hours</p> <p>No power applied Delta °C < 1.0°C/min Delta % R.H. < 1.5% R.H./min</p>
Approvals	USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.3 FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T

Technical Specifications - Environmental Data

Eco-Label Certifications and declarations This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US ENERGY STAR®
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration
- EPEAT™ Rated – GOLD
- Korea Eco-label
- Japan PC Green label*

* This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'

Small Form Factor

System Configuration

Energy Consumption

Normal Operation On-Idle (ENERGY STAR Idle (S0))

ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)

ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)

ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)

ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)

Heat Dissipation*

Normal Operation On-Idle (ENERGY STAR Idle (S0))

ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)

ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)

AC Input Voltage at 115 VAC
+/- 5 VAC, 60 Hz +/- 3 Hz

58.845 W

AC Input Voltage at 230 VAC
+/- 5 VAC, 50 Hz +/- 3 Hz

57.922 W

AC Input Voltage at 100 VAC
+/- 5 VAC, 50 Hz +/- 3 Hz

59.386 W

3.5388 W

3.796 W

3.5329 W

3.5041 W

3.7921 W

3.5187 W

1.9653 W

2.2104 W

1.916 W

1.0306 W

1.2865 W

1.0084 W

AC Input Voltage at 115 VAC
+/- 5 VAC, 60 Hz +/- 3 Hz

200.779 BTU/hr

AC Input Voltage at 230 VAC
+/- 5 VAC, 50 Hz +/- 3 Hz

197.629 BTU/hr

AC Input Voltage at 100 VAC
+/- 5 VAC, 50 Hz +/- 3 Hz

202.625 BTU/hr

12.074 BTU/hr

12.951 BTU/hr

12.054 BTU/hr

11.955 BTU/hr

12.938 BTU/hr

12.005 BTU/hr

Technical Specifications - Environmental Data

ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)	6.705 BTU/hr	7.541 BTU/hr	6.537 BTU/hr
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)	3.516 BTU/hr	4.389 BTU/hr	3.44 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
System Fan Off		
Idle	3.9	29
Fixed Disk (random writes)	3.9	29

Batteries This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 2000ppm by weight.

Battery size: CR2032 (coin cell)

Battery type: Lithium

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the GOLD level, see: www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 93% recyclable when properly disposed of at end of life.

Packaging Materials	Corrugated Paper	1915 g
	EPE Foam	135 g
	LDPE Bag	25 g

- The EPE foam packaging material is made from 30 to 60% industrial recycled content.
- The corrugated paper packaging materials contain at least 80% post consumer recycled content.

Technical Specifications - Environmental Data

Minitower

System Configuration	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Minitower Desktop model is based on a typically configured product.		
Energy Consumption	AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz	AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz	AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz
Normal Operation On-Idle (ENERGY STAR Idle (S0))	61.772 W	58.107 W	59.222 W
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)	2.6393 W	3.0205 W	2.678 W
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)	2.6475 W	3.0336 W	2.7218 W
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)	1.2281 W	1.5847 W	1.3381 W
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)	0.7837 W	1.1556 W	0.8801 W
Heat Dissipation*	AC Input Voltage at 115 VAC +/- 5 VAC, 60 Hz +/- 3 Hz	AC Input Voltage at 230 VAC +/- 5 VAC, 50 Hz +/- 3 Hz	AC Input Voltage at 100 VAC +/- 5 VAC, 50 Hz +/- 3 Hz
Normal Operation On-Idle (ENERGY STAR Idle (S0))	210.766 BTU/hr	198.261 BTU/hr	202.065 BTU/hr
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Enabled)	9.005 BTU/hr	10.305 BTU/hr	9.137 BTU/hr
ENERGY STAR "Sleep" (S3) (Wake On LAN (WOL) Disabled)	9.033 BTU/hr	10.35 BTU/hr	9.286 BTU/hr
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Enabled)	4.19 BTU/hr	5.406 BTU/hr	4.565 BTU/hr
ENERGY STAR "Standby" (Off) (S5) (Wake On LAN (WOL) Disabled)	2.673 BTU/hr	3.942 BTU/hr	3.002 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions
(in accordance with
ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	3.8	28
Fixed Disk (random writes)	4.2	30



Technical Specifications - Environmental Data

Batteries

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product **do not** contain:

- Mercury greater than 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 2000ppm by weight.

Battery size: CR2032 (coin cell)

Battery type: Lithium

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2002/95/EC.
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the GOLD level, see: www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 93% recyclable when properly disposed of at end of life.

Packaging Materials	Corrugated Paper	1700 g
	EPE Foam	138 g
	LDPE Bag	50 g

- The EPE foam packaging material is made from 30 to 60% industrial recycled content.
- The corrugated paper packaging materials contains at least 80% post consumer recycled content.

Small Form Factor, Minitower

RoHS Compliance

Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. By July 1, 2006, RoHS substances were virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at:
http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde



Technical Specifications - Environmental Data

- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBeS)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <http://www.hp.com/recycle> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/recyclers>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:
Global Citizenship Report
<http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html>
Eco-label certifications
<http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html>
ISO 14001 certificates:
<http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html>

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